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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,269	04/05/2005	William A Steer	GB 020172	4629

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BRIARCLIFF MANOR, NY 10510

EXAMINER

CHOWDHURY, AFROZA Y

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/530,269

Applicant(s)

STEER, WILLIAM A

Examiner

Afroza Y. Chowdhury

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 8-15 is/are rejected.
- 7) ☐ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment received on **Dec 26, 2007** has been entered. Claims 1-20 are pending. Claims 16-20 are new. Applicant's arguments are addressed herein below.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **"feedback system is provided between the current-measurement supply line (34) and the control line (6)"** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

Art Unit: 2629

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 and 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Oomura** (US Pub. 2003/0020413) in view of **Pae et al.** (EP1221686).

As to claim 1, Oomura discloses an active matrix display comprising:
an electroluminescent (EL) display element (fig. 6(OLED)) and
a drive transistor (fig. 6(T2)) for driving a current ([0088]) through the display element (fig. 6(OLED));
a first switch (fig. 6(T3)) enabling power from a power supply line (fig. 6(Vdd)) to be supplied to the display element ([0088], [0091]),

a second switch (fig. (T5)) for routing current from a current-measurement supply line (fig. 6(I_m)) to the display element (fig. 6(OLED)),

the first and second switches (fig. 6(T3, T5)) being operated in complementary manner (fig. 6); and

a control line (fig. 6(V_w)) for controlling the gate voltage applied to the drive transistor (fig. 6(T2)).

Oomura does not teach a feedback system provided between the current-measurement supply line and the control line.

Pae et al. teaches a driving circuit where a feedback system (fig. 3, col. 5, [0035], [0040]) is provided between the current-measurement supply line (fig. 2, 3(I_{ref})) and the control line (fig. 2(data line)).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to incorporate the feedback system of Pae et al. into Oomura's active matrix display to make an electroluminescent display device in order to provide desired current source operation of pixel.

As to claim 2, Oomura (as modified by Pae et al.) teaches a device where the feedback system (fig. 3, col. 5, [0035], in Pae et al.) enables a gate voltage to be determined corresponding to a desired current flow through the drive transistor (fig. 2(P0), in Pae et al.).

As to claim 3, Oomura (as modified by Pae et al.) teaches a device wherein the feedback system (fig. 3, col. 5, [0035], in Pae et al.) is provided in a column driver of the display device (fig. 2, 3(ramp), in Pae et al.).

As to claim 4, Oomura (as modified by Pae et al.) teaches a device where each pixel further comprises a storage capacitor (fig. 6,C in Oomura) for storing a gate-source voltage of the driving transistor (abstract, [0094], [0102], in Oomura).

As to claim 8, Oomura (as modified by Pae et al.) teaches a device wherein each switch comprises a transistor (fig. 6(T3, T5), in Oomura).

As to claim 9, Oomura (as modified by Pae et al.) teaches a device wherein one of the switches is an NMOS TFT and the other is a PMOS TFT (fig. 6(T3, T5), in Oomura).

As to claim 10, Oomura (as modified by Pae et al.) teaches a device as claimed in any preceding claim, wherein the feedback system comprises:

a current-to-voltage converter section for providing a first voltage corresponding to the current drawn from the current-measurement supply line (fig. 6, [0102], in Oomura);

a comparator section for comparing the first voltage with an input voltage representing the desired current ([0102], in Oomura); and

Art Unit: 2629

a drive section for providing a voltage on the control line (0088], in Oomura), the feedback loop being in equilibrium when the control line voltage provides drive of the drive transistor giving rise to a current corresponding to the input voltage ([0092], in Oomura).

As to claim 11, Oomura (as modified by Pae et al.) teaches a device as claimed in any preceding claim, wherein the device is operable in two modes:

a first mode in which a desired pixel drive current is drawn from the current-measurement supply line and the feedback system generates the corresponding gate voltage for the drive transistor (fig. 6, in Oomura), the corresponding gate-source voltage for the drive transistor being stored (fig. 6, [0094], in Oomura); and

a second mode in which a current is driven through the drive transistor (fig. 6, in Oomura) and the EL display element using the stored gate-source voltage ([0088], in Oomura).

As to claim 12, Oomura discloses a method of addressing an active matrix electroluminescent display device comprising,

in which each pixel comprises an electroluminescent (EL) display element (fig. 6(OLED)) and

a drive transistor (fig. 6(T2)) for driving a current ([0088]) through the display element (fig. 6(OLED)),

the method comprising, for each pixel: applying a voltage (fig. 6) to the drive transistor (fig. 6(T2)) to drive a current through the display element (fig. 6(OLED)), [0088], [0093]),

the current being drawn from a current-measurement supply line (fig. 6),
processing the current using feedback control circuitry outside the array of pixels (fig. 6) and having an input representing the desired current ([0091] – [0093]),

generating a control voltage in the feedback control circuitry for the drive transistor (fig. 6(T2)) using the processed current (fig. 6, [0102]),

within the pixel, storing a voltage (fig. 6, C) derived from the control voltage (abstract, [0094], [0102]); and

drawing current from a power supply line (fig. 6(Vdd)) to illuminate the display element (fig. 6(OLED)).

Oomura does not teach implementing a feedback control loop which reaches equilibrium when the current corresponds to the desired current.

Pae et al. teaches implementing a feedback control loop (fig. 2, 3, col. 5, [0035], [0040]) which reaches equilibrium [0041] when the current corresponds to the desired current,

supplying the control voltage (col. 5, [0034], [0040]) to the pixel; and
applying the stored voltage (fig. 2, col. 5, [0034]) to the gate of the drive transistor (fig. 2(P0)).

Therefore, it would have been obvious to one skill in the art at the time of the invention was made to combine the driving circuit of Pae et al. with Oomura's active

matrix display to make an electroluminescent display device in order to drive current for realizing a desired luminance.

As to claim 13, Oomura (as modified by Pae et al.) teaches a method wherein a processing the current comprises converting the current into a voltage (fig. 3, col. 6, [0045], in Pae et al), and comparing the voltage (fig. 3, col. 6, [0045], in Pae et al.) with an input voltage representing the desired current to produce an amplified differential output (col. 6, [0042], in Pae et al.).

As to claim 14, Oomura (as modified by Pae et al.) teaches a method where the control voltage comprises the amplified differential output (col. 6 in Oomura).

As to claim 15, Oomura (as modified by Pae et al.) teaches a method wherein current is drawn from the power supply line through a first switch (fig. 6(T3), in Oomura) and

current is drawn from the current-measurement supply line (fig. 6(Im), in Oomura) through a second switch (fig. 6(T5), in Oomura),

the first and second switches (fig. 6(T3, T5), in Oomura) being operated in complimentary manner (fig. 6, in Oomura),

the first switch (fig. 6(T3), in Oomura) being used after an initial pixel programming phase ([0093], in Oomura) and

the second switch (fig. 6(T5), in Oomura) being used during the initial pixel programming phase ([0093] - [0093], in Oomura).

5. Newly submitted claims 16-20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The newly added claims deals with providing "a first current, improving mode, modifying a control voltage, storing voltage, and storing voltage in a second mode" which is different from originally presented claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 16-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Allowable Subject Matter

6. Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claim 5, prior art does not show, "**an address transistor connected between the control line and the gate of the drive transistor**" in combination with other limitations of claim 5.

As to claim 6, prior art does not show, "**address transistor, and the first and second switches are each controlled by a shared control line**" in combination with other limitations of claim 6.

As to claim 7, prior art does not show, "**the address transistor and the second switch are controlled synchronously**" in combination with other limitations of claim 7.

Response to Arguments

7. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Afroza Y. Chowdhury whose telephone number is 571-270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
2/26/2008



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